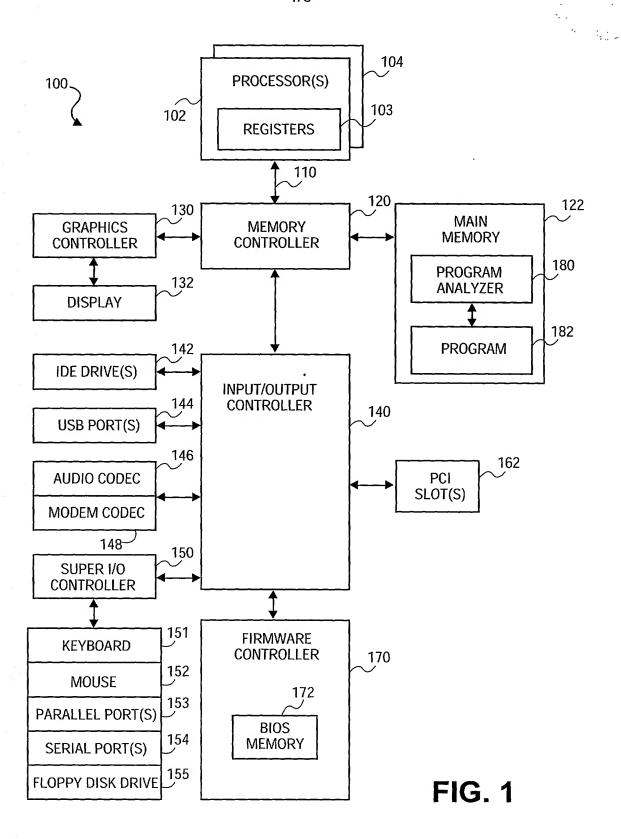TITLE: REGISTER ALLOCATION FOR PROGRAM EXECUTION ANALYSIS
INVENTOR(S): LEONID BARAZ, ET AL.
ATTY. DOCKET NO.: 42390.P8254

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FIG. 1

TITLE: REGISTER ALLOCATION FOR PROGRAM EXECUTION ANALYSIS
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200

202
ANALYZE PROGRAM HAVING A CALLER ROUTINE AND
A CALLEE ROUTINE TO BE CALLED BY THE CALLER ROUTINE

204
MODIFY PROGRAM TO EXPAND REGISTER SET FOR CALLER ROUTINE
BY ONE OR MORE ADDITIONAL REGISTERS

206
MODIFY ANY AFFECTED REGISTER REFERENCES FOR CALLER ROUTINE

208
MODIFY PROGRAM TO STORE AND/OR USE DATA IN ONE OR MORE ADDITIONAL
REGISTERS FOR CALLER ROUTINE TO ANALYZE PROGRAM EXECUTION

210
MODIFY PROGRAM TO EXPAND REGISTER SET FOR CALLEE ROUTINE
BY ONE OR MORE ADDITIONAL REGISTERS

212
IDENTIFY SEQUENCE OF ONE OR MORE REGISTER MOVES
FOR REGISTER SET FOR CALLEE ROUTINE
(FIG. 4)

214
MODIFY PROGRAM TO PERFORM REGISTER MOVE(S)
FOR REGISTER SET FOR CALLEE ROUTINE

216
MODIFY ANY AFFECTED REGISTER REFERENCES FOR CALLEE ROUTINE

218
MODIFY PROGRAM TO STORE AND/OR USE DATA IN ONE OR MORE ADDITIONAL
REGISTERS FOR CALLEE ROUTINE TO ANALYZE PROGRAM EXECUTION

220
IDENTIFY SEQUENCE OF ONE OR MORE REGISTER MOVES
FOR REGISTER SET FOR CALLER ROUTINE
(FIG. 4)

222
MODIFY PROGRAM TO PERFORM REGISTER MOVE(S)
FOR REGISTER SET FOR CALLER ROUTINE
PRIOR TO OR UPON RETURNING FROM CALLEE ROUTINE TO CALLER ROUTINE

FIG. 2

TITLE: REGISTER ALLOCATION FOR PROGRAM EXECUTION ANALYSIS
INVENTOR(S): LEONID BARAZ, ET AL.
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FIG. 3

TITLE: REGISTER ALLOCATION FOR PROGRAM EXECUTION ANALYSIS
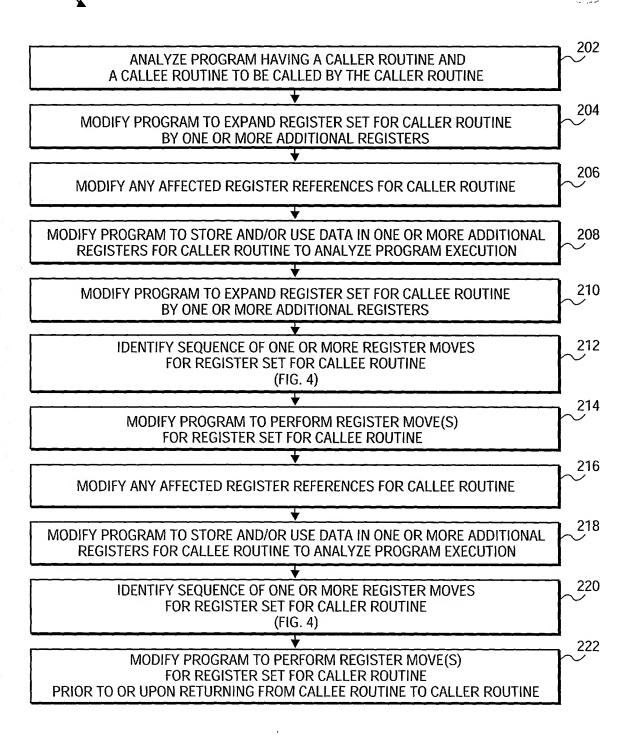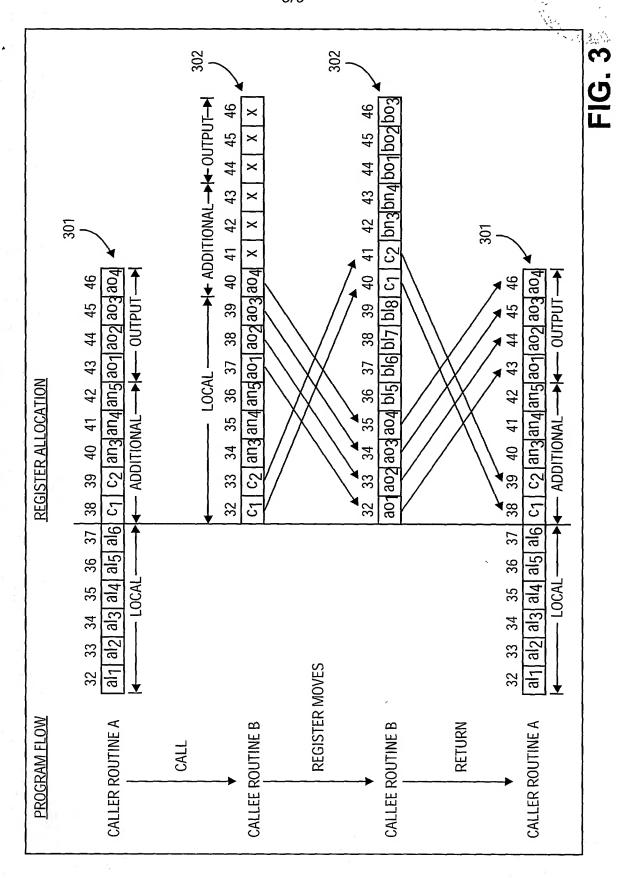INVENTOR(S): LEONID BARAZ, ET AL.
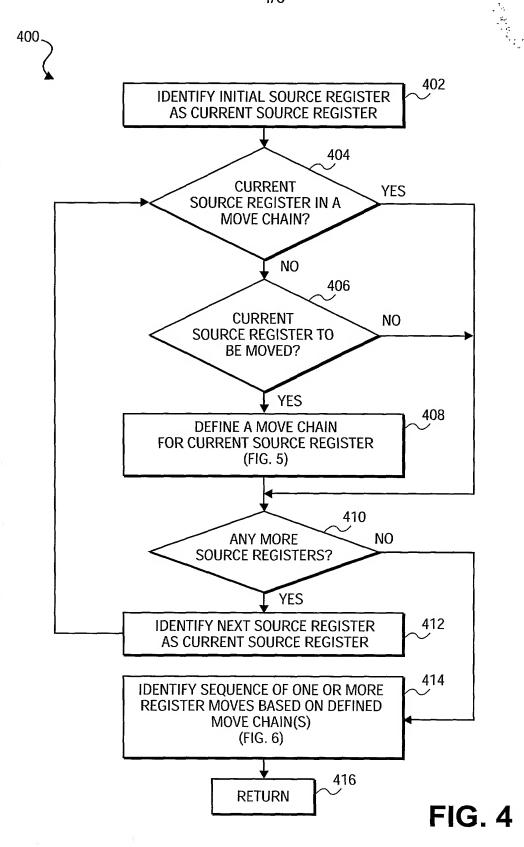ATTY. DOCKET NO.: 42390.P8254

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400

402
IDENTIFY INITIAL SOURCE REGISTER
AS CURRENT SOURCE REGISTER

404
CURRENT
SOURCE REGISTER IN A
MOVE CHAIN?
— YES

NO

406
CURRENT
SOURCE REGISTER TO
BE MOVED?
— NO

YES

408
DEFINE A MOVE CHAIN
FOR CURRENT SOURCE REGISTER
(FIG. 5)

410
ANY MORE
SOURCE REGISTERS?
— NO

YES

412
IDENTIFY NEXT SOURCE REGISTER
AS CURRENT SOURCE REGISTER

414
IDENTIFY SEQUENCE OF ONE OR MORE
REGISTER MOVES BASED ON DEFINED
MOVE CHAIN(S)
(FIG. 6)

416
RETURN

FIG. 4

TITLE: REGISTER ALLOCATION FOR PROGRAM EXECUTION ANALYSIS
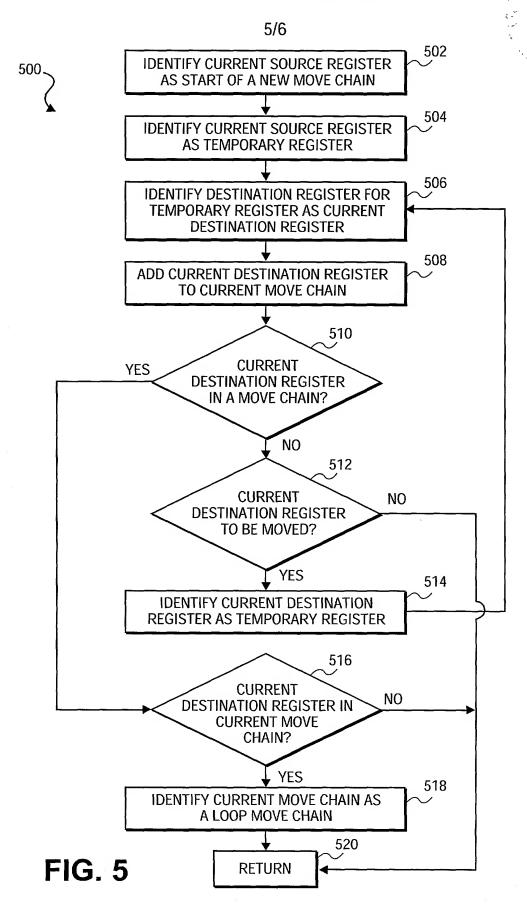INVENTOR(S): LEONID BARAZ, ET AL.
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500

IDENTIFY CURRENT SOURCE REGISTER
AS START OF A NEW MOVE CHAIN — 502

IDENTIFY CURRENT SOURCE REGISTER
AS TEMPORARY REGISTER — 504

IDENTIFY DESTINATION REGISTER FOR
TEMPORARY REGISTER AS CURRENT
DESTINATION REGISTER — 506

ADD CURRENT DESTINATION REGISTER
TO CURRENT MOVE CHAIN — 508

CURRENT
DESTINATION REGISTER
IN A MOVE CHAIN? — 510

YES

NO

CURRENT
DESTINATION REGISTER
TO BE MOVED? — 512

NO

YES

IDENTIFY CURRENT DESTINATION
REGISTER AS TEMPORARY REGISTER — 514

CURRENT
DESTINATION REGISTER IN
CURRENT MOVE
CHAIN? — 516

NO

YES

IDENTIFY CURRENT MOVE CHAIN AS
A LOOP MOVE CHAIN — 518

FIG. 5

RETURN — 520

TITLE: REGISTER ALLOCATION FOR PROGRAM EXECUTION ANALYSIS
INVENTOR(S): LEONID BARAZ, ET AL.
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600

602
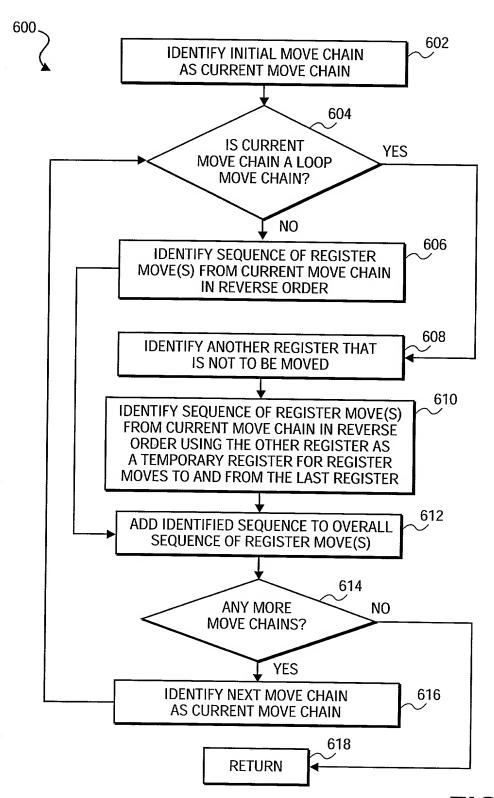IDENTIFY INITIAL MOVE CHAIN
AS CURRENT MOVE CHAIN

604
IS CURRENT
MOVE CHAIN A LOOP
MOVE CHAIN?

YES

NO

606
IDENTIFY SEQUENCE OF REGISTER
MOVE(S) FROM CURRENT MOVE CHAIN
IN REVERSE ORDER

608
IDENTIFY ANOTHER REGISTER THAT
IS NOT TO BE MOVED

610
IDENTIFY SEQUENCE OF REGISTER MOVE(S)
FROM CURRENT MOVE CHAIN IN REVERSE
ORDER USING THE OTHER REGISTER AS
A TEMPORARY REGISTER FOR REGISTER
MOVES TO AND FROM THE LAST REGISTER

612
ADD IDENTIFIED SEQUENCE TO OVERALL
SEQUENCE OF REGISTER MOVE(S)

614
ANY MORE
MOVE CHAINS?

NO

YES

616
IDENTIFY NEXT MOVE CHAIN
AS CURRENT MOVE CHAIN

618
RETURN

FIG. 6